IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

MASAYUKI YOSHIDA et al.

Group Art Unit: 1773

Examiner:

Continuation of S.N. 09/230,872

Filed: Herewith

For: PHENOLIC-FORMALDEHYDE RESIN COATED METAL SURFACES AND PROCESS THEREOF

Attorney Docket No.: HSTI 0128 PUS

PRELIMINARY AMENDMENT

Commissioner for Patents
United States Patent and Trademark Office
Washington, D.C. 20231

Sir:

Please amend the above-identified application as follows:

IN THE TITLE:

Please amend the title to read as follows:

--A METAL-COATING-FILM LAMINATE SYSTEM AND A METHOD OF USE OF THE COATING IN A FILM LAMINATING PROCESS--.

IN THE SPECIFICATION:

Please insert the following new section immediately following the title:

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation of U.S. application Serial No. 09/230,872, filed on February 1, 1999, which is based on PCT/US97/13685, having an international filing

date of 31 July 1997, which claims the priority of a Japanese patent application number H8-219282, filed on August 1, 1996.

IN THE CLAIMS:

Please cancel claims 2-18 and add new claims 19-35 as follows.

19. (New) A metal-coating-film laminate system comprising:

a metal substrate;

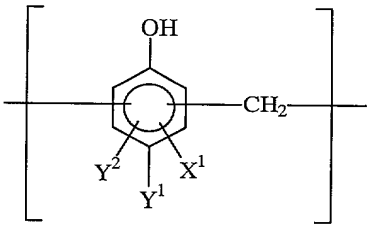
a coating applied to the metal substrate; wherein

said coating has a thickness that is from 5 to 500 nm;

said coating has a content of carbon atoms that corresponds to from 5 to 500 mg/m^2 of the coating area;

said coating covers at least 90% of the surface of the metal; and

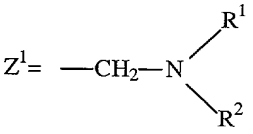
said coating comprises polymer molecules that comprise units conforming to general formula (I):



(I)

in which:

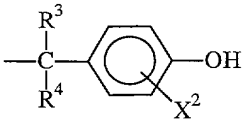
X^1 independently in each structural unit is a hydrogen atom or a moiety Z^1 conforming to general formula (II):



(II)

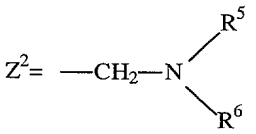
in which each of R^1 and R^2 independently is a hydrogen atom, a C_1 to C_{10} monovalent alkyl moiety, or a C_1 to C_{10} monovalent hydroxyalkyl moiety;

Y^1, independently for each unit, is a hydrogen atom, a hydroxyl group, a C_1 to C_5 alkyl moiety, a C_1 to C_5 hydroxyalkyl moiety, a C_6 to C_{12} aryl, benzyl, or benzo moiety, or a moiety conforming to general formula (III):



(III)

in which, independently for each unit according to general formula (I) in which Y^1 conforms to general formula (III), each of R^3 and R^4 is independently a hydrogen atom, a C_1 to C_{10} alkyl moiety, or a C_1 to C_{10} hydroxyalkyl moiety, and X^2 is a hydrogen atom or a moiety Z^2 conforming to general formula (IV):



(IV)

in which each of R^5 and R^6 is independently a hydrogen atom, a C_1 to C_{10} alkyl moiety, or a C_1 to C_{10} hydroxyalkyl moiety; and

Y^2, independently for each unit, is a hydrogen atom or, when Y^1 and Y^2 are bonded to adjacent carbon atoms in the aromatic ring shown in general formula (I), Y^1 and Y^2, and said adjacent carbon atoms to which Y^1 and Y^2 are bonded together may constitute a condensed benzene ring,

said polymer molecules that comprise structural units conforming to general formula (I) having a total number of Z^1 and Z^2 moieties and a distinct (but not necessarily unequal) total number of (i) units conforming to general formula (I) and (ii) Y^1 moieties that conform to general formula (III), such that the total number of Z^1 and Z^2 moieties has a ratio to the total number of units conforming to general formula (I) and Y^1 moieties that conform to general formula (III) that is from 0.2:1.0 to 1.0:1.0; and

a film applied to the coating.

20. (New) A metal-coating-film laminate system according to claim 19, in which Y^1 in general formula (I) conforms to general formula (III).

21. (New) A metal-coating-film laminate system according to claim 19, in which the coating comprises a total of at least 0.1 mg/m^2 of phosphorus atoms present in phosphoric acid-like compounds and silicon atoms present in organosilicon compounds.

22. (New) A metal-coating-film laminate system according to claim 20, in which the coating comprises a total of at least 0.1 mg/m^2 of phosphorus atoms present in phosphoric acid-like compounds and silicon atoms present in organosilicon compounds.

23. (New) A metal-coating-film laminate system according to claim 19, wherein:

said coating has a thickness in a range from 50 to 300 nm; and

said coating has a content of carbon atoms that corresponds to from 50 to 200 mg/m^2 of the coating area.

24. (New) A metal-coating-film laminate system according to claim 19 in which the coating system is applied to the metal substrate as a reactive coating.

25. (New) A metal-coating-film laminate system according to claim 19 in which the coating system is applied to the metal substrate as a dry-in-place coating.

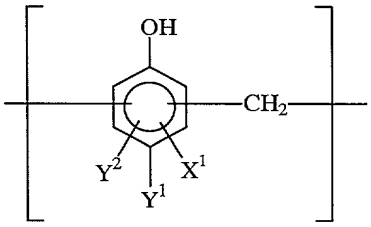
26. (New) A metal-coating-film laminate system according to claim 19 in which the metal substrate is selected from the group consisting of iron, steel, and aluminum.

27. (New) A method of use of a coating composition in a film laminating process, comprising the steps of:

(1) providing a surface of a metal substrate with the coating composition so that the metal substrate is suitable for laminating a film thereto, said method comprising the steps of:

(I) preparing the coating composition by providing a waterborne composition that comprises water and:

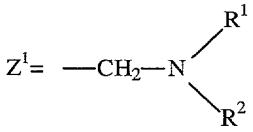
(A) at least 0.01 g/L of polymer molecules comprising units conforming to general formula (I):



(I)

in which:

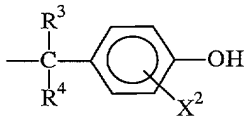
X^1, independently in each structural unit, is a hydrogen atom or a moiety Z^1 conforming to general formula (II):



(II)

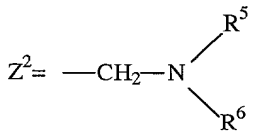
in which each of R^1 and R^2 independently is a hydrogen atom, a C_1 to C_{10} monovalent alkyl moiety, or a C_1 to C_{10} monovalent hydroxyalkyl moiety;

Y^1, independently for each unit, is a hydrogen atom, a hydroxyl group, a C_1 to C_5 alkyl moiety, a C_1 to C_5 hydroxyalkyl moiety, a C_6 to C_{12} aryl, benzyl, or benzo moiety, or a moiety conforming to general formula (III):



(III)

in which, independently for each unit according to general formula (I) in which Y^1 conforms to general formula (III), each of R^3 and R^4 is independently a hydrogen atom, a C_1 to C_{10} alkyl moiety, or a C_1 to C_{10} hydroxyalkyl moiety, and X^2 is a hydrogen atom or a moiety Z^2 conforming to general formula (IV):



(IV)

in which of R^5 and R^6 is independently a hydrogen atom, a C_1 to C_{10} alkyl moiety, or a C_1 to C_{10} hydroxyalkyl moiety; and

Y^2, independently for each unit, is a hydrogen atom or, when Y^1 and Y^2 are bonded to adjacent carbon atoms in the aromatic ring shown in general formula (I), Y^1 and Y^2, and said adjacent carbon atoms to which Y^1 and Y^2 are bonded together may constitute a condensed benzene ring,

said polymer molecules that comprise structural units conforming to general formula (I) having a total number of Z^1 and Z^2 moieties and a distinct (but not necessarily unequal) total number of (i) units conforming to general formula (I) and (ii) Y^1 moieties that conform to general formula (III), such that the total number of Z^1 and Z^2 moieties has a ratio to the total number of units conforming to general formula (I) and Y^1 moieties that conform to general formula (III) that is from 0.2:1.0 to 1.0:1.0;

and, optionally, at least one of the following components:

(B) phosphoric acid-type compounds; and

(C) organosilicon compounds,

said waterborne composition having a pH in a range from 2.5 to 6.5;

(II) contacting said surface of said metal substrate with the waterborne composition provided in step (I) for a sufficient time at a sufficient temperature to form a solid coating containing constituents of said waterborne composition, said solid coating adhering to said surface of said metal substrate and being itself covered, at least initially, by a coating of liquid;

(III) after step (II), drying the metal surface so as to remove from the metal surface the liquid constituents of the coating initially formed in step (II) or of a successor liquid coating formed by rinsing the surface of said metal substrate as modified after step (II) with water; and

(2) applying a film to the metal substrate coated with the composition provided according to step (1) to form a metal-coating-film laminate system whereby the method reduces industrial waste and minimizes gaseous emissions.

28. (New) A method of use of a coating composition in a film laminating process according to claim 27, in which Y^1 in general formula (I) conforms to general formula (III).

29. (New) A method of use of a coating composition in a film laminating process according to claim 28, in which the waterborne composition provided in step (I) comprises a total of at least 0.01 g/l of phosphorus atoms present in phosphoric acid-like compounds and silicon atoms present in organosilicon compounds.

30. (New) A method of use of a coating composition in a film laminating process according to claim 28, wherein the waterborne composition provided in step (I) contains at least 0.1 g/l of polymer molecules comprising units conforming to general formula (I) and the coating of liquid formed in step (II) is rinsed with water so as to form a successor coating before completion of step (III).

31. (New) A method of use of a coating composition in a film laminating process according to claim 30, in which the waterborne composition provided in step (I) comprises a total of at least 0.1 g/l of phosphorus atoms present in phosphoric acid-like compounds and silicon atoms present in organosilicon compounds.

32. (New) A method of use of a coating composition in a film laminating process according to claim 27, in which the coating system is applied to the metal substrate as a reactive coating.

33. (New) A method of use of a coating composition in a film laminating process according to claim 27, in which the coating system is applied to the metal substrate as a dry-in-place coating.

34. (New) A method of use of a coating composition in a film laminating process according to claim 27, in which the metal substrate is selected from the group consisting of iron, steel, and aluminum.

35. (New) A method of use of a coating composition in a film laminating process according to claim 27 wherein the film is selected from the group consisting of polyethylene, polycarbonate, polyester, and polymers of vinyl terephthalate.

Remarks

This application is a continuation of U.S. Serial No. 09/230,872. In that case, claims 1-18 were pending, and claims 17 and 18 were allowed.

The intent of this Preliminary Amendment is to cancel claims 2-18, while leaving claim 1 standing to assure co-pendency.

The thrust of the claims in this continuation case is to claim a metal-coating-film laminate system and a use of the coating in a film laminating process.

Claims 19-23 and 27-29 of the present case correspond respectively to claims 1-8 of its predecessor. Claims 30-31 of the present case correspond to claims 10 and 11 of its predecessor.

Claims 19-35 are introduced without introduction of new matter.

This Preliminary Amendment is accompanied by a copy of a Petition for Extension of Time that was submitted under separate cover, extending the period of time within which to respond to the Office Action of June 11, 2001 in the parent case.

Respectfully submitted,

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By _____

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Date: October 11, 2001

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